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ABSTRACT

The philosophical justification for private industry involvement in specialized training is that these needs are of such magnitude as to require the best efforts of all who can contribute. The practical justification stems from the realization by industry that it must provide specialized manpower training to meet its own need for effective employees. Industry entrance into the training field dates from the latter part of the past century when no secondary schools offered industrial training. By the late sixties higher education activities of business and industry reportedly totaled almost $20 billion annually, with about 85 percent of the major industries involved. Industrial participation in education and training programs outside industry is a more recent phenomenon. This development grew out of the application of technology to educational problems, and was made possible to a great extent by federal and state programs dating from the mid-sixties. An even newer type of activity is that referred to as performance contracting, another approach to solving some of the problems in education. (Author/AF)

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THE GROWING DEVELOPMENT OF SPECIALIZED TRAINING WITHIN PRIVATE INDUSTRY FOR PROFESSIONAL, PARAPROFESSIONAL, AND TECHNICAL PERSONNEL*

by

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Specialized training in private industry for professional, paraprofessional and technical personnel is a large subject that can only be highlighted in a brief paper. It consists of in-service and continuing education programs within industry, and it can also be interpreted to include training and educational programs provided by industry for other agencies of society, including schools and colleges.

Education in Industry

The earliest form of education in industry was apprenticeship training, originally a very good arrangement for the employer and a penurious indenture for the employee. Government intervention in the early years of this century, however, significantly improved the apprentice's lot. Apprenticeship programs are still important sources of skilled workers and supervisory personnel in many industries.

Alongside apprenticeship training there developed in the late nineteenth century more formal in-service training programs, the so-called "corporation schools":

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> The striking expansion of the economy after the middle of the nineteenth century, with its insistent demand for skilled labor, and the fact that in the United States, even by 1870, no public or private educational institution on a secondary level offered industrial training, left the industrialists little choice but to establish their own schools. . . . At least five such schools were established between 1872 and 1901. . . the National Association of Corporation Schools, organized in 1913. . . had 150 members when it merged with the American Management Association in 1922. *

The need for managerial talent became apparent in World War I, and industry began to look to the colleges and universities for help. For a time, especially in the twenties, it appeared that formal education might meet the need. Business and industrial activity during the thirties, however, was greatly reduced and the existing pool of experienced management talent was seriously depleted. World War II then began to absorb manpower into the military just when it was also badly needed in industry, which was becoming increasingly complex in its manpower requirements.

> Product diversification, multiplant development, and decentralized organization necessitate a prolonged period of induction and suitable orientation procedures for new recruits; manpower shortage calls for upgrading and retraining on a huge scale; and above all, new techniques of management, the never-ending strains of new inventions. . ., and the rapidly progressing plans. . . require that corporation personnel be continuously informed and instructed and remain flexible, ever receptive to change. **

These factors, among others, led to "the great upsurge of education in industry" which has taken place since World War II.

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*Harold F. Clark and Harold S. Sloan, Classrooms in the Factories; An Account of Educational Activities Conducted by American Industry, 1960, p. 6.

**Ibid., pp. 7-9.

In 1957, Harold Clark and Harold Sloan studied the education and training activities of 349 "of the largest American Corporations." Of these, 296 or 85 percent reported that they carried on "some sort of educational activity requiring regular attendance by participants." The most common programs were orientation (93 percent), managerial development (90.5 percent), human relations (85 percent), technical and professional (68 percent), and general education (16 percent). Courses were offered to factory and clerical workers, respectively, in 44.5 percent and 31 percent of the companies.*

The Chase Manhattan Bank estimated in 1962 that about $17 billion would be devoted to "education by business" that year.** A 1963 survey of corporations working in scientific and technical fields revealed that increases in annual expenditures for educational activities ranged from three to eight times the amount spent for these purposes a decade earlier.***

A study in 1967 examined the college level courses, institutes, seminars and conferences then underway in industry (including short-term and long-term, for degree credit and not-for-credit). Three general types of college level education were identified: the up-dating of scientists and engineers, management training, and the introduction of new technology

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*Ibid., pp. 13-17.

**Sally J. Olean, Changing Patterns in Continuing Education for Business, 1967, p. 8.

***William G. Torpey, "Company Investment in Continuing Education for Scientists and Engineers," Educational Record, Fall 1964, p. 408.

(e. g., the computer). According to this study, annual higher education expenditures by industry in 1967 amounted to

> nearly twenty billion dollars, spent by approximately eighty-five percent of the major industries in America.
> .. . . This growth has occurred largely since World War II, during a period in which universities have been almost completely absorbed in meeting problems of their own growth and expansion. . . . while universities were adding classes and short courses and television studios and centers for continuing education, they gave the needs and demands of business short shrift. And business could not wait. *

The extent of involvement of selected corporations as of the mid-sixties will suggest the range of educational activities to be found in industry:

> Sperry Gyroscope in 1964 had 1800 employees working at all degree levels plus 900 more at in-house programs. . . . [IBM] used the figure $75 million as its 1966 outlay for educational programs within the United States. This figure represents primarily instruction costs . . . **

The education programs of several major corporations might be of interest. At RCA Corporation there are several continuing education programs, including a tuition refund plan and a graduate study program with several options. In 1968 a significant new program was initiated in continuing engineering education using video-taped courses. The current catalog for that program lists 66 courses, 45 of which are now available on video tape. In Fall 1970, 534 RCA engineers were enrolled

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*Olean, op. cit., pp. iii, 3.

**Ibid., p. 9.

in 32 classes using video tape in 13 different plants. In the first two years of the program 1788 engineers participated. Arrangements have recently been made with the Florida Institute of Technology for RCA employees to work toward master's degrees through these video-taped courses, with brief sojourns on the FIT campus in Melbourne.

At Bell Laboratories, several programs have been developed to keep their employees abreast of the rapid developments in communications technology. The present continuing engineering education program was initiated in Fall 1969, with 3340 professional employees (about 60 percent) enrolled in 65 courses. Courses are offered at varying levels of difficulty in the six curricular areas: materials and devices, switching, transmission, systems engineering and math, physical design, and computer science.*

Courses at Bell Labs are also offered outside working hours without charge and free textbooks are supplied. About 15 percent of the employees take part in this program. Over 100 courses are made available, from the most elementary to the most advanced.

Three types of in-house training programs are offered at Monsanto Chemical Company: technical, management development, and training in organizational procedures and policies. The technical program courses are 15 to 16 weeks in length; courses are one-half on company time, and one-half on the employee's time; free textbooks and materials are provided; homework assignments and tests are given; completion certificates

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*E. D. Reed, Continuing Technical Education at Bell Laboratories. (Paper presented at IEEE Convention, New York, April 3, 1970, mimeographed.) pp. 1, 16, 17.

are awarded; and attendance and participation are voluntary (supervisor approval is required to drop a course).

Several types of educational programs are also available at Sandia Corporation for its employees. Among the most popular are the "out-of-hours" courses, taken by about one-third of the employees each year. Most classes are offered at the noon hour, with others scheduled in the evening. Specifically, at its Albuquerque plant with approximately 6400 employees, in any given term at any given noon hour about 2000 are participating. Over 100 courses are offered each term, limited not by demand but by classroom space available. Any employee may register for any course for which he is qualified, textbooks are furnished, homework and tests are required, and certificates of completion are awarded. Employees may also audit courses.

Five different curricula are also provided at Sandia for technical support personnel, 20 courses in each curriculum. The Technical Institute curricula are in electronics, mechanical, drafting design and administrative technology; and a program for data reduction clerks and analysts. *

These examples are not intended to reflect the full range of educational programs available in the companies mentioned. They are clearly only illustrative of what is going on in several hundred companies throughout the country.

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*Information concerning Bell Laboratories, Monsanto Chemical Company, and the Sandia Corporation was drawn largely from J. M. Biedenbach, Industry-Sponsored Continuing Engineering Education Programs, May 6, 1969 (mimeographed).

There are, of course, many programs for employees in industry that have been developed in cooperation with two-year colleges* and senior colleges and universities, and the specialized manpower training and professional education programs of the armed forces. They have been excluded from this discussion as being beyond the scope of this paper.

Industry in Education

Discussion to this point has centered on education in industry, primarily industry-sponsored internal education and training programs for employees. Industry's role in education external to the company and as a seller of goods and services is the other side of the coin.

"Big Business Discovers the Education Market" was the theme of the January 1967 issue of the Phi Delta Kappan. Myron Lieberman, the guest editor, wrote that

> no development has more potential for changing American education than the growing involvement of big business with production and sale of educational goods and services.

He also noted that "a primary objective of the new educational technology is to individualize instruction". **

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*See, for example, "A College Moves Off Campus to Teach," U.S. News and World Report, August 17, 1970, pp. 46-47.

**Myron Lieberman, "Big Business, Technology and Education," Phi Delta Kappan, January 1967, p. 185. Two excellent references on the role of educational technology in individualizing instruction are John W. Wentworth, Educational Technology, Individualized Instruction, and Continuing Engineering Studies. (Paper presented at Annual Meeting of Continuing Engineering Studies Division, ASEE, Albuquerque, November 5, 1970, mimeographed.) p. 5; and John W. Harmon, "A New Approach to Employee Training," Business Management, June 1967, pp. 93-96.

It was reported in 1971 that "despite all of the attention it has gotten, the education business is rather small potatoes. It totals $1.5 billion a year. . . ," about 3.7 percent of the total expenditures for public elementary and secondary education.* Most, but not all, of this "education business" is in materials and equipment; some of it is for services performed. It is interesting to note that industry in 1970 reportedly spent over $1.2 billion for "equipment" for education and training,** an amount almost equal to industry's sales of materials and equipment to education.

The period since 1967 has not been a smooth one for a number of the so-called "education industries." The executive vice president of McGraw-Hill, in a recent article in the Saturday Review, noted that

> The leaders of many so-called education companies . . . seem to be losing confidence in the premise that technology can change education. Having eagerly embraced that enticing proposition a few years ago, and having since discovered that it is more difficult to consummate than they expected, some now appear ready to abandon it.***

After a troubled period when educators scoffed and business lost money, the educational technology pendulum may be swinging back. A few years ago information companies found that while there was a market for the newer educational technologies, there were all too few customers. Some new trends, however, may be giving educational technology a new lease on life.

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*Robert W. Locke, "Has the Education Industry Lost Its Nerve?" Saturday Review, January 16, 1971, p. 44. In 1970-71, $40.7 billion will be spent by public elementary and secondary schools, excluding loans for new buildings. (School Management, January 1971, p. 16.)

**According to the American Management Association.

***Locke, op. cit., p. 42.

Given the facts that schools are sometimes among the most innovation-resistant institutions in our society, that money for education remains tight in a fumbling economy, and that education technology companies in the past were not always modest in their claims, there is still the expectation that some long-hoped-for utilization of educational technology's true potential may soon be underway.

A growing role of industry in education is in contracts for services. In many instances this is accomplished through federal manpower training programs. The 1970 Manpower Report of the President, among other things, assessed the "role and objectives of manpower and related programs." It noted that

> Federal expenditures for manpower, training, and work programs increased from $403 million to $2.2 billion between fiscal years 1964 and 1969. . . Enrollments in federally assisted work and training programs rose from 278,000 in fiscal 1964 to nearly 1.8 million in fiscal 1969. Assuming that the Congress accepts the Administration's budget request, enrollments will be over 2 million in the next fiscal year.*

There were steady increases in enrollments during 1969 in the Concentrated Employment Program (CEP); the Work Incentive Program for welfare clients; and the Jobs Opportunities in the Business Sector Program (JOBS), "in which private industry employs and trains the hard core unemployed with Government financial aid." In some of the older programs,

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*"Manpower Report to the President," Occupational Outlook Quarterly, Summer 1970, p. 28.

> enrollments leveled off or decreased. . . institutional and on the job training under the Manpower Development and Training Act (MDTA), the Neighborhood Youth Corps. . . , and the Job Corps. Though MDTA resources have increased, they have been used, along with those under the Economic Opportunity Act, to finance the CEP and the JOBS Program, as efforts have been focused increasingly on providing the broadest possible range of manpower training and supportive services.*

Litton Industries Ingalls' shipyard at Pascagoula, Mississippi, illustrates training in industry that is funded, at least in part, by federal manpower programs. A major contribution is being made to the expansion efforts of the company by three federal manpower programs under which 1500 persons are being trained: MDTA, JOBS, and Apprenticeships. The shipyard, through these and other company programs,

> is acquiring the sheet-metal workers, welders, boiler workers, machinists, electricians, pipefitters, and shipfitters to manufacture its highly technical and complex products. Many of them are recruited from the Job Corps.**

RCA Corporation is a good illustration of a company that is engaged in the training of paraprofessional and technical personnel in a variety of ways, through contracts for services. The RCA Institutes has a residence school in New York which for years has trained radio and TV technicians, a studio school to train persons who will work in TV production, an institute for professional development through which workshops and seminars are run, a custom education division which handles special training projects such as programs funded from MDTA and related sources, and a home study (correspondence) program.

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*Ibid.

**Jack Shepherd, "They Shape our Ships," Manpower, December 1970, pp. 13-14.

The RCA Service Company has operated two Job Corps centers, manages the training program of a juvenile correctional institution in Pennsylvania, ran a training program among the Choctaw Indians in Mississippi, and operates a training program for marginal farm workers in North Carolina (including special programs for their wives and day care for their children). RCA also has a contract with the Camden schools to provide professional and paraprofessional in-service training for all levels of school personnel; has trained food service workers for the school systems of Camden and Trenton and is now involved in a more comprehensive food services project with a number of school systems in Northern New Jersey; and has developed a program whereby management is provided for fast-track building construction in schools and colleges from the design stage through to completion - a turnkey operation.

These are but examples of contracts for services. Some are and some are not related to the federal manpower training programs mentioned earlier.

The Complementary Roles of Educational Institutions and Industry

Dr. Patricia Cross, in a position paper prepared for the White House Conference on Youth, stated that

> The most rapidly growing segment of American Education is the "Educational Periphery," a term which has been used. . . to describe systematic educational activities which go on outside the educational core of elementary, secondary, and higher education.

She identified six categories of programs in the educational periphery: 1) those sponsored by employers, 2) proprietary schools, 3) anti-poverty programs such as MDTA and the Job Corps, 4) correspondence courses, 5) educational television, and 6) adult education.

"Learning should be lifelong," she noted, "and easy exit and re-entry into a flexible and fluid educational system must be assumed in developing new educational models." She concluded that equality of educational opportunity will be only a hollow phrase "if our educational models remain unidimensional and designed for young people prior to their entrance to the labor market."*

Clark and Sloan in their 1957 report stated that

> The notion that education ends with a college degree is completely untenable in industry today. Colleges and universities are doing what they can to provide basic technical, managerial and liberal-arts training as well as specialized instruction in graduate programs, seminars and institutes, but the pace is so rapid that educational institutions removed even one step from the reality of production are frequently lacking in both equipment and experience.**

J. M. Biedenbach, director of continuing engineering education programs at RCA, was reported recently to have said that about 70 percent of the technical employees of large corporations are working in jobs for which they were not trained. He noted that industry is faced with a work force whose initial training is soon not useful and that "about 50 percent

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*K. Patricia Cross, Equality of Educational Opportunity, [n. d.] pp. 11, 14, and 19.

**Clark and Sloan, op. cit., p. 9.

of the training received by 1960 graduates of engineering colleges is now outdated*

Robert D. Calkins, former president of the Brookings Institution, has stated that

> the intellectual capital acquired in youth is no longer adequate, either in the individual's vocation or profession, or for his personal life in a society of rapid change. Unless one continually adapts his interests, understanding, and skills, his effectiveness is destroyed by innovation, technological and social change, and the obsolescence of knowledge. Self-renewal has ceased to be an avocation for the few. It is, in these changing times, a necessity for the many and an imperative for society and the nation. **

With the challenges that face the nation and education, and the magnitude of the job to be done, it is clear that the best that can be offered by the institutions and by industry should be drawn upon in the search for more effective approaches and better solutions. I hope and believe that industry will continue to play its part as a member of the team, and as a partner for progress with education. ***

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*"Technical Employees Mismatched To Their Jobs," Machine Design, November 26, 1970, p. 8.

**Robert D. Calkins, "'Re-educating the Educated' - A Look at Continuing Education," New England Center for Continuing Education Bulletin, Winter 1971, p. 2.

***See John W. Wentworth, "Industry and Education - Potential Partners for Progress," Educational Media, May 1969, pp. 7-9.